

What is claimed is:

1. An anisotropic exchange spring magnet powder comprising:
a hard magnetic material phase containing a rare earth metal
element, a transition metal element, and at least one element
selected from the group consisting of boron (B), carbon (C),
nitrogen (N) and oxygen (O),

a soft magnetic material phase containing a transition metal
element, and at least one element selected from the group
consisting of boron (B), carbon (C), nitrogen (N) and oxygen
(O), and wherein

said hard magnetic material phase and soft magnetic material
phase have crystal particle diameters of 150 nm or less.

2. The anisotropic exchange spring magnet powder according
to Claim 1, wherein the content of said rare earth metal element
is from 2 to 15 atomic %, and the content of at least one element
selected from the group consisting of boron (B), carbon (C),
nitrogen (N) and oxygen (O) is from 1 to 25 atomic %.

3. The anisotropic exchange spring magnet powder according
to Claim 1, wherein said rare earth metal element is at least
one element selected from the group consisting of neodymium (Nd),
praseodymium (Pr) and samarium (Sm).

4. The anisotropic exchange spring magnet powder according
to Claim 1, wherein said transition metal element is composed
mainly of iron (Fe) or (Co).

25 5. A method of producing an anisotropic exchange spring
magnet powder comprising steps of:

preparing a crystalline mother material containing a hard
magnetic material phase containing a rare earth metal element,
a transition metal element, and at least one element selected
from the group consisting of boron (B), carbon (C), nitrogen
(N) and oxygen (O), and a soft magnetic material phase
containing a transition metal element, and at least one element
selected from the group consisting of boron (B), carbon (C),
nitrogen (N) and oxygen (O), and/or, the crystalline mother
30 material partially having amorphous parts;

amorphousating said crystalline mother material, and
re-crystallizing said amorphousated mother material.

6. The method of producing an anisotropic exchange spring
magnet powder according to Claim 5 wherein treatment is
5 conducted by repeating a continuous process composed of said
amorphousating process and crystallizing process, once or more
times.

7. The method of producing an anisotropic exchange spring
magnet powder according to Claim 5 wherein said crystalline
10 mother material having amorphous parts has a content of
amorphous parts obtained by temperature property of
magnetization of 95% or less.

8. The method of producing an anisotropic exchange spring
magnet powder according to Claim 5 wherein in said crystallizing
15 process, anisotropy is imparted to the crystalline mother
material amorphousated in said amorphousating process and the
material is molded while solidifying.

9. The method of producing an anisotropic exchange spring
magnet powder according to Claim 5 wherein said amorphousating
20 process is conducted under a condition in which oxygen is
blocked, in any of vacuum, an inert gas, nitrogen and an organic
solvent.

10. The method of producing an anisotropic exchange spring
magnet powder according to Claim 5 wherein said crystallizing
25 process is conducted under a condition in which oxygen is
blocked, in any of vacuum, an inert gas, nitrogen and an organic
solvent.

11. The method of producing an anisotropic exchange spring
magnet powder according to Claim 5 wherein said crystallizing
30 process has a crystallization heating treatment temperature of
950°C or less.

12. The method of producing an anisotropic exchange spring
magnet powder according to Claim 5 wherein said crystallizing
process has a crystallization heating treatment time of 1 hour
35 or less.

13. An anisotropic exchange spring magnet obtained by treatment, in an anisotropy-imparting molding process and a solidification process, of an anisotropic exchange spring magnet powder comprising a hard magnetic material phase containing a rare earth metal element, a transition metal element, and at least one element selected from the group consisting of boron (B), carbon (C), nitrogen (N) and oxygen (O), and a soft magnetic material phase containing a transition metal element, and at least one element selected from the group consisting of boron (B), carbon (C), nitrogen (N) and oxygen (O), wherein said hard magnetic material phase and soft magnetic material phase have crystal particle diameters of 150 nm or less.

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